NOTES.

The annual meeting of the Iron and Steel Institute will be held at the Institution of Civil Engineers, 25, Great George Street, London, on Wednesday and Thursday, May 24 and 25. On Wednesday business will be transacted; the Bessemer Gold Medal for 1893 will be presented to Mr. John Fritz, of Bethlehem, Pa., U.S.A.; and the president-elect, Mr. E. Windsor Richards, will deliver his inaugural address. The following papers will afterwards be read and discussed: "On the elimination of sulphur from iron and steel" (second paper), by J. E. Stead; "On the Saniter process of desulphurisation," by E. H. Saniter. On Thursday the following papers will be read and discussed:—"On the basic process of Witkowitz," by F. Kupelwieser; "Notes on puddling iron," by John Head; "On a recording pyrometer," by Prof. Roberts-Austen, F.R.S.

The Royal Society *soirée* was being held as Nature went to press yesterday evening.

A dinner will be given by the Master and Fellows of Gonville and Caius College, Cambridge, on Wednesday, June 21, in the College Hall, to celebrate the tercentenary of the admission of William Harvey to the college.

The annual dinner of the Royal Geographical Society will take place on Saturday, May 13, at the Whitehall Rooms, Hôtel Métropole, Sir M. E. Grant Duff, President of the Society, in the chair.

The second annual Robert Boyle Lecture of the Oxford University Junior Scientific Club will be delivered in the University Museum on Tuesday, the 16th inst., at 8.30 p.m., by Lord Kelvin, P.R.S. His subject will be, "The Molecular Tactics of Crystals."

The Geologists' Association has made arrangements for a geological excursion to Farnham on Saturday, May 13. During Whitsuntide there will be an excursion to Bradford-on-Avon and Westbury, in Wiltshire.

The late Lord Derby has left by will to the Royal Society a sum of £2000. He has also bequeathed £2000 to the Royal Institution.

The Royal Society of New South Wales offers its medal and £25 for the best communication sent in not later than May 1, 1894, containing the results of original research or observation upon each of the following subjects:—(1) On the timbers of New South Wales, with special reference to their fitness for use in construction, manufactures, and other similar purposes; (2) on the raised sea-beaches and kitchen middens on the coast of New South Wales; (3) on the aboriginal rock-carvings and paintings in New South Wales.

The Royal Hungarian Academy of Sciences at Buda-Pesth has devoted the sum of 2000 fl. to the promotion of botanical investigations during the year 1893.

The Committee of the Kew Observatory has issued its report for the year ending December 31, 1892.

The Council of the Durham College of Science has resolved to offer to each county council in England the right of nominating a scholar who shall attend the course of instruction in the agricultural department of the college without the payment of fees, on condition that the county council pay to the scholar not less than £30 towards the cost of his board and lodging in Newcastle or the neighbourhood, and of such books or appliances as he may require for his study. The scholarships will be tenable in the first instance for one year, but may be renewed for a second year by the college council if the progress of the student is satisfactory. The object of the college council is twofold: to bring before the notice of county councils and others the advantages offered by its agricultural department, and to make some acknowledgment to the country generally for the contributions it has received from imperial sources through the Board of Agriculture.

The Yorkshire Naturalists' Union is making a great effort to double its membership, and ought to have little difficulty in accomplishing its purpose, as it is one of the most vigorous of the provincial scientific societies. Its funds are at present insufficient to justify it in publishing all the important works it has in hand.

Mr. M. A. Veeder writes to us from Lyons, New York, that Lieut. Peary, of the United States Navy, during his coming expedition to the northernmost Greenland, will record observations of the aurora, upon a plan that will enable comparisons to be made in detail with records from other localities. "The plan," Mr. Veeder says, "is already in operation, upon an international basis, and the results are proving to be important. Numerous observers widely distributed are desirable, and inasmuch as even those who have no special technical knowledge may make entries that will be of value any who feel so disposed may co-operate." Further information and supplies of blanks may be obtained from Mr. Veeder, who will be glad to receive also, any records of observations of the aurora whatever, for purposes of comparison.

Moderate rains occurred in the north and west, in the early part of last week, owing to the advance of depressions from the Atlantic, and a small amount of rain fell in the midland counties, but over the southern and eastern parts of England there was no measurable quantity. The drought has continued with great persistency over the southern part of the kingdom, the period without rain, up to Tuesday the 9th inst., being fifty-three days at some of the stations reporting to the Meteorological Office. An anticyclone embraced the greater part of western Europe throughout the past week, and spread westwards over the British Islands, causing high atmospheric pressure, while in northern Scandinavia the barometer rose to nearly 31 inches. The temperature has been irregular; although high for the time of year, it has been lower generally than some weeks ago; in a few instances the daily maxima have exceeded 70°, but in parts they have been little above 50°. The *Weekly Weather Report* of the 6th instant showed a general decrease of bright sunshine. The percentage of possible duration ranged from 18 to 27 in Ireland, from 22 to 30 in Scotland, and from 41 to 57 in England; in the Channel Islands the high percentage of 81 was recorded.

At the meeting of the French Meteorological Society on April 4 Dr. Fines presented a note on the violence of the storms which are occasionally experienced in the province of Roussillon (Eastern Pyrenees). On five occasions between 1860 and 1867 railway trains have been overturned on the line from Narbonne to Perpignan. A storm of great violence occurred from January 15 to 24 last, in which at one time the velocity amounted to 85 miles an hour. A large number of trees were uprooted and some loaded railway trucks were overturned on this occasion.

The annual general meeting and *conversazione* of the Selborne Society were held at the rooms of the Royal Society of British Artists yesterday evening. The objects of this excellent society are: to preserve from unnecessary destruction such wild birds, animals, and plants as are harmless, beautiful, or rare; to discourage the wearing and use for ornament of birds and their plumage, except when the birds are killed for food or reared for their plumage; to protect places and objects of interest or natural beauty from ill-treatment or destruction; and to promote the study of natural history. Many good writers on natural history contribute to the society's journal, *Nature Notes*.

A CAPITAL paper on the manufactures of India was read by Sir Juland Danvers before the Indian Section of the Society of Arts on April 24, and is published in the current number of the Society's Journal. Sir Juland is of opinion that, if all legitimate means are taken for opening the markets of the world to Indian commerce and for stimulating enterprise and energy by developing the country itself, India may become a large manufacturing as well as an agricultural country, and thus be enabled not only to support but to improve the condition of her vast population. The reading of the paper was followed by a most interesting discussion, in the course of which several high authorities expressed their cordial agreement with the views stated by Sir Juland Danvers. Sir C. E. Bernard said that short of vast discoveries of workable gold within her borders India's true and only way out of the silver difficulty that threatens her with bankruptcy is the rapid development of her home industries, especially her cotton and iron manufactures.

THE Trinidad Field Naturalists' Club prints in its Journal for April a valuable preliminary list of the mammals of Trinidad, by Mr. Oldfield Thomas, of the British Museum (Natural History). Mr. Thomas explains that he has prepared the list as a basis on which a complete scientific list of the mammals inhabiting Trinidad may be founded, and to show members of the society how extraordinarily little is definitely known of the mammals of the island. By known, of course, he means scientifically known in the sense of being published to the world, for he has no doubt whatever that many members of the society could off-hand add to the list many animals well-known to them and other inhabitants, but neither hitherto mentioned in scientific publications nor represented by specimens in the British Museum. He earnestly begs that all persons interested in the natural history of Trinidad will do what they can to obtain specimens and to send them home for identification. Every collection made at present is sure, he says, to contain species new to the island, even if not—as in the case of two bats recently received from Trinidad—altogether new to science.

A PAPER on "Recreation," read by Mr. William Odell before the Torquay Natural History Society, has been printed separately. It contains some very interesting letters from the head masters of public schools as to the effect of athletics on school work.

MR. FREDERICK J. HANBURY and the Rev. E. S. Marshall are engaged in the preparation of a Flora of Kent, which should prove an exceptionally rich county flora, though some districts have as yet been but imperfectly searched. Any assistance will be gladly received by the Rev. E. S. Marshall, Milford Vicarage, Godalming.

MR. A. T. DRUMMOND has been investigating the colours of flowers in Ontario and Quebec in relation to the time of flowering, and has contributed to the *Canadian Record of Science* an interesting paper on the subject. He finds that April, May, and even June and July are remarkable for the prevalence of white flowers, July and especially August of yellow, and September and October of purple and blue.

GOOD illustrations of the difficulty of determining plants or vegetable productions by popular or local names are given in a letter by Mr. B. B. Smyth, of the Kansas Academy of Science, published in the current Quarterly Record of the Royal Botanic Society of London. "The name Nightshade," he says, "is applied here to *Solanum nigrum* and *S. triflorum*; the name Woody Nightshade is applied to *S. Dulcamara*; the name Bittersweet is applied to *Celastrus scandens*, a twining woody plant with clusters of showy scarlet berries; the name Laurel is applied to the different species of Kalmia; the names Mock Orange and Syringa are applied (of course misapplied) to Philadelphus; the name Sarsaparilla is (mis)applied to Aralia; the name Snakeroot is applied to a dozen different species in half as many different orders; the name Mouse-ear is applied to Gnaphalium, Antennaria, and Cerastium."

WE have repeatedly called attention to the fact that the German publisher Engelmann is issuing an important series of small volumes consisting of papers which have marked an era in the history of science. A series of much the same kind has been begun, we are glad to note, by Mr. W. F. Clay, Edinburgh, and Messrs. Simpkin, Marshall and Co., London. The volumes in this series are to be known as "Alembic Club Reprints.' The first volume consists of Joseph Black's paper, entitled, "Experiments upon Magnesia Alba Quicklime, and other Alcaline Substances."

THE Natural History Society of Marlborough College has issued its report for the year ending Christmas, 1892. The high standard of work in the sections is said to have been, on the whole, well maintained; but an exception is made in the case of the zoological section, the members of which showed "little disposition to exert themselves in work conducted on scientific lines." The library of the society is rapidly increasing. Among the works added to it during the year were the four splendidly illustrated volumes (privately printed) on excavations and archæological discoveries in or near Wilts, by General Pitt-Rivers. These were presented by the author, to whom special thanks are accorded for his "peculiarly interesting and valuable gift."

ARISTOTLE, it seems, knew almost as much about field voles as is known by those who have lately been studying the mischief done by these creatures in Thessaly and Scotland. In a passage quoted in the current number of the *Zoologist* from his "Natural History of Animals" he speaks of their power of destruction as "so great that some small farmers, having on one day observed that their corn was ready for harvest, when they went the following day to cut their corn, found it all eaten." "The manner of their disappearance also," he continues, "is unaccountable; for in a few days they all vanish, although beforehand they could not be exterminated by smoking and digging them out, nor by hunting them and turning swine among them to root up their runs. Foxes also hunt them out, and wild weasels are very ready to destroy them; but they cannot prevail over their numbers and the rapidity of their increase, nor indeed can anything prevail over them but rain, and when this comes they disappear very soon." This passage is quoted in the *Zoologist* by Mr. A. H. Macpherson. The editor adds a note showing that Aristotle was by no means the only ancient writer to whom the facts were familiar.

MR. G. LEWIS contributes to the current number of the *Entomologist* a list of coleoptera new to the fauna of Japan, with notices of unrecorded synonyms. Some of the list are well-known European species; others have hitherto been known from Siberia only. Mr. Lewis says that some years will elapse before the collection gathered by him in Japan can be completely worked out.

AN interesting paper on mining and ore-treatment at Broken Hill, New South Wales, was read at the meeting of the Institution of Civil Engineers on May 2, the authors being Mr. M. B. Jamieson and Mr. J. Howell. From this mine silver and lead of the value of over £8,250,000 sterling had been taken within seven years; and it continued to yield about

220,000 ounces of silver, and between 600 and 800 tons of lead per week. Speaking of the products of the refinery, the authors said they were thus disposed of:—The pure silver was sold in the colonies by tender at stated intervals, in parcels of between 100,000 ounces and 150,000 ounces, and was purchased by the banks usually at a price somewhat above the price current in London. The soft lead was shipped either to England or to China; the latter country was becoming gradually a larger buyer of the company's lead. The matte and other compound products were shipped to England. The small amount of gold in the ore was recovered in the refinery. It amounted to about 3·4 dwt. per ton of bullion.

Mr. C. Hedley has contributed to the Proceedings of the Linnean Society of New South Wales (Second Series, vol. vii.) an interesting paper on the range of *Placostylus*, which he describes as a more fruitful subject of study than any other molluscan genus inhabiting the same area. Their large and handsome shells have attracted the attention of the most superficial and unscientific collectors, so that an extensive series has been brought to the knowledge of investigators from remote localities. In the summary of his results, Mr. Hedley remarks, first, on the essential unity of the *Placostylus* area as a zoological province, embracing the archipelagoes of Solomon, Fiji, New Hebrides, Loyalty, New Caledonia, Norfolk I. (?), Lord Howe, and New Zealand; a unity explicable, he thinks, only on the theory that they form portions of a shattered continent and are connected by shallow banks formerly dry land. This continental area he proposes to call the Melanesian plateau. He holds, secondly, that this Melanesian plateau was never connected with, nor populated from, Australia, but that its fauna was probably derived from Papua *viâ* New Britain. The presence of genera common to Australia and New Zealand he believes to be explicable on the ground that they migrated, not from the one territory to the other, but each from a common source, New Guinea. Thirdly, he thinks that New Zealand and New Caledonia were early separated from the northern archipelagoes and ceased to receive overland immigrants therefrom. Fourthly, the Fijis, according to Mr. Hedley, remained to a later date in communication with the Solomons, but were severed from that group before the latter had acquired from Papua much of its present fauna.

The "Year Book of Australia" for 1893 has been published. It includes an interesting account of scientific work done in the various Australian colonies during 1892. This has been compiled from information supplied by the scientific societies of Australia.

Some valuable reports on the Victorian coalfields, by Mr. James Stirling, of the Geological Survey of Victoria, have been issued by the Department of Mines in that colony. They are fully and most carefully illustrated.

A French translation of Lord Kelvin's "Popular Lectures and Addresses" has been published by Messrs. Gauthier-Villars et Fils. The translator is P. Lugol, who has added some notes. Translations of extracts from recent memoirs by Lord Kelvin, with notes, have been contributed by M. Brillouin.

A fresh instalment of the Proceedings of the American Academy of Arts and Sciences (New Series, vol. xix.) has just been published. It covers the period from May 1891 to May 1892. Among the contents are some considerations regarding Helmholtz's theory of consonance, by C. R. Cross and H. M. Goodwin; a note on the dependence of viscosity on pressure and temperature, by C. Barus; what electricity is: illustrated by some new experiments, by W. W. Jacques; on a theorem of Sylvester's relating to non-degenerate matrices, by H. Taber; researches on the volatile hydrocarbons, by C. M. Warren; descriptions of new plants collected in Mexico by C. G. Pringle in 1890 and 1891, with notes upon a few other species, by B. L. Robinson; on some experiments with the phonograph, relating to the vowel theory of Helmholtz, by C. R. Cross and G. V. Wendell, and other papers.

A paper entitled "Further Studies of Yuccas and their Pollination" has been contributed by Mr. W. Trelease to the fourth annual report of the Missouri Botanical Garden, and is also published separately. It is well illustrated.

The new number of the *Quarterly Journal of the Geological Society* includes the text of the anniversary address of the President, Mr. W. H. Hudleston, F.R.S. He deals with the work brought before the Society in the course of the last seven years, during which he has served the Society in one official capacity or another.

A fourth edition of "Practical Physics," by R. T. Glazebrook and W. N. Shaw, has been issued by Messrs. Longmans, Green, and Co. The authors have taken advantage of this opportunity to make some alterations and additions suggested by their own experience or that of their successors at the Cavendish Laboratory.

In a recent number of the *Comptes Rendus*, M. Rigollot gives a further account of his experiments on the electrochemical actinometer. He finds that the electromotive force developed when light falls on a plate of oxydised copper immersed in a solution of a metallic iodide, bromide or chloride can be considerably increased if it has previously been dipped in some colouring matter, such as eosine or safranine. This increase of sensitiveness is different for rays of different wave lengths, and those rays which produce the maximum effect, for any one colouring substance, depend on the position of the absorption band in the light which is transmitted by that substance.

M. Chassagny has a note in the current number of the *Comptes Rendus* on the influence of longitudinal magnetisation on the electromotive force of an iron-copper thermo-electric junction. Two couples were used, one being in the axis of a long magnetising helix, so joined together that they acted in opposite directions. The results obtained were:—(1) The effect of longitudinal magnetisation is always to increase the electromotive force. (2) This increase is independent of the direction of magnetisation. (3) For increasing fields the increase is at first very nearly proportional to the strength of the field, and attains a maximum value of 6·1 microvolts for a field of 55 C.G.S. units. After this it slowly decreases till for a field of 200 units it is 3·2 microvolts.

At the meeting of the Société Française de Physique, held on April 21, M. P. Curie gave some of the results of his experiments on the magnetic properties of bodies at different temperatures. The body to be experimented on was placed in a non-uniform magnetic field and the force acting on it measured by the torsion of a metallic wire. An electric heater capable of raising the temperature of the body to 1400° C. was used, together with one of Le Chatelier's thermo-elements to measure the temperature. In the case of oxygen, the magnetic permeability is constant for magnetising forces of from 200 to 1350 units, and for pressures of from 5 to 20 atmospheres. The law of variation of the permeability with temperature is very simple, since between 20° and 450° it varies inversely as the absolute temperature. In the case of air, the permeability at a temperature t is given by the formula $10^6\mu_t = 2760/t^2$, which can be used to correct observations made in air at any temperature.

A NEW reaction, of wide general application and of considerable practical utility, by means of which the important organic compounds known as nitriles may be readily prepared in a state of purity, has been discovered by Prof. Michaelis and Dr. Siebert, and is described by them in the current number of *Liebig's Annalen.* As stated in our chemical note of last week, Prof. Michaelis has recently been studying the action of thionyl chloride, $SObl_2$, upon the primary amines, and has shown that the product of the reaction is a thionylamine, a compound formed by the replacement of the two hydrogen atoms of the NH_2 group of the amine by the radical thionyl, SO. In seeking to ascertain whether a similar kind of compound to the thionylamines is formed when thionyl chloride is allowed to act upon the amides of the acid radicles, Prof. Michaelis and Dr. Siebert have discovered the new mode of preparing the nitriles. Instead of a compound of such a nature being produced, a nitrile is the main product, with sulphur dioxide and hydrochloric acid as bye products. As the two latter are gaseous substances, it is at once evident that the reaction must afford a particularly convenient mode of preparing the nitriles in a state of purity. The reaction, moreover, is quite general, and is applicable both in the fatty and in the aromatic series. When thionyl chloride is brought in contact with acetamide, $CH_3 . CO . NH_2$, a violent reaction occurs, with considerable rise of temperature. After a few minutes, however, the violence diminishes, and the liquid eventually becomes quiescent. In order to complete the interaction, the product should then be heated over a water-bath for a few hours, the reaction flask being provided with a reflux condenser. When the fumes of hydrochloric acid and the odour of sulphur dioxide are no longer perceptible, the reaction is completed in accordance with the equation—

$$CH_3 . CO . NH_2 + SObl_2 = CH_3 . CN + SO_2 + 2Hbl.$$

The dark-coloured liquid is then decanted from a small quantity of resinous products of decomposition and distilled, when pure acetonitrile, clear and colourless, passes over it at its boiling point, 82°. The yield of pure nitrile is about half the weight of acetamide employed. The violence of the reaction between thionyl chloride and acetamide is very much diminished by the addition of benzene; but owing to the difficulty of separating the resulting nitrile from the benzene by fractional distillation, it is preferable not to employ it. With care, the direct addition of the thionyl chloride may be made without loss. Propionamide reacts in a very similar manner with thionyl chloride, and almost the whole of the liquid product distils over quite colourless at the boiling point of propionitrile (98°). In like manner, pure benzonitrile may be obtained by the action of thionyl chloride upon the amide of benzoic acid. It is preferable, however, in case of such higher boiling nitriles which can be readily separated from benzene by fractional distillation, to conduct the operation in presence of benzene, the reaction then proceeding much more regularly and without the violence of the direct action. Upon subsequent distillation, the thermometer at once rises to 190° after the distillation of the benzene, and remains constant at that temperature until almost the whole of the benzonitrile has passed over.

NOTES from the Marine Biological Station, Plymouth.—Last week's captures include the Hydroid *Hydractinia echinata*, the Polychæta *Eunice Harassii* and *Siphonostoma uncinatum*, the Polyzoan *Pedicellina cernua*, the Opisthobranchs *Runcina coronata* and *Polycera Lessonii*, the Crustacean *Hyas araneus*, and the Echinoderms *Cucumaria Planci* and *Luidia ciliaris*. The quantity of gelatinous algæ in the Channel waters at length exhibits signs of diminution. Medusæ of the remarkable Hydroid *Corymorpha nutans* (of Allman) have been taken in the tow-nets on several occasions. The medusæ of *Aurelia aurita* are growing rapidly in size, and have now attained an average diameter of 1¼ inches. The *Megalopæ* of *Carcinus* are no longer commonly taken in the tow-nets, but are chiefly to be found in especial haunts at the sea-bottom. The following animals, not hitherto noted, are now breeding: the Hydroids *Plumularia setacea* and *Antennularia ramosa*, the Decapod Crustacea *Crangon fasciatus* and *Hippolyte Cranchii*, the Ophiurid *Amphiura elegans* (= *squamata*), the Ascidian *Styelopsis grossularia*, and several species of Amphipoda and Pantopoda.

THE additions to the Zoological Society's Gardens during the past week include two Mozambique Monkeys (*Cercopithecus pygerythrus*, ♀ ♀) from East Africa, presented respectively by Mr. Arthur James and Miss Maude Parkinson; a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Miss G. Lloyd; a Bonnet Monkey (*Macacus sinicus*, ♀) from India, presented by Mr. R. Hughes; a Macaque Monkey (*Macacus cynomolgus*, ♀) from India, presented by Mr. F. Byfield; an Indian Buffalo (*Bubalus buffelus*, ♀) from India, presented by H.H. The Maharaja of Bhoonagar; a Common Hedgehog (*Erinaceus europæus*) British, presented by Mrs. E. Austen-Leigh; a West African Love-Bird (*Agapornis pullaria*) from West Africa, presented by Lady Theodora Guest; two Herring Gulls (*Larus argentatus*) British, presented by Mr. W. H. Aplin; two Egyptian Mastigures (*Uromastix spinipes*) from Egypt, presented by Mr. Edmund Lamb; a Moorish Tortoise (*Testudo mauritanica*) from North Africa, presented by Mr. T. W. Bayley; seven Green Tree Frogs (*Hyla arborea*) South European, presented by the Rev. C. D. Fothergill; a Silvery Gibbon (*Hylobates leuciscus*) from Malacca, a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, twenty Green Tree Frogs (*Hyla arborea*) South European, deposited; two Amherst Pheasants (*Thaumalea amherstiæ*, ♀ ♀) from Szechuen, China, a Swinhoe's Pheasant (*Euplocamus swinhoii*, ♂) from Formosa, three Cat Fish (*Amiurus catus*) from North America, purchased; a Common Crowned Pigeon (*Goura coronata*) from New Guinea, received in exchange; a Yak (*Poëphagus grunniens*), ♀), a Water Buck (*Cobus ellipsiprymnus*, ×), an Angora Goat (*Capra hircus. var.* ♂,), a Bennett's Wallaby (*Halmaturus bennetti*, ♂) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

MERIDIAN CIRCLE OBSERVATIONS.—At the meeting of the Royal Astronomical Society, held on April 14 last, the proceedings of which are recorded in the current number (No. 201) of the *Observatory*, the paper prepared by Messrs. Turner and Hollis (and read by the former) entitled, "Comparison of the Greenwich Ten-year Catalogue (1880) with the Cape Catalogue (1880)," was the means of instigating an interesting discussion with reference to questions relating to systematic error of meridian observations. The questions thus raised are of great importance, for, as Dr. Gill remarks, they "affect the objects for which public observatories were founded." Generally speaking the comparison of the catalogues above mentioned seems to have given very satisfactory results, but the series of differences obtained from the north-polar-distances, arranged in order of north polar distance, showed signs of small divergences. The source from which these differences could have arisen seems—since the accuracy of the N.P.D. places depends on the coefficient of refraction—to be at first sight apparent, and Mr. Stone's opinion is that this quantity is "practically mixed up with the question of refraction," his firm conviction being that in the Cape observations there are no systematic errors possible to account for $0''\cdot4$. Dr. Gill, in referring to the discussion generally, made some very striking remarks about meridian observations, and was of opinion that at the Cape there were sources of systematic error amounting possibly to half a second of arc. The differences obtained from the reflex and direct observations at the Cape, he says, have led him to the conclusion that they are caused by the fact that, "since the walls of the transit room are